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Neighbourhood Characteristics and the Distribution of Crime on the Island of Montréal: Additional Analysis on Youth Crime

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Abstract

This study explores the geographic distribution of youth crime on the Island of Montréal. The analysis is based on police-reported crime data from the Incident-based Uniform Crime Reporting Survey, 2001 Census data, land-use data from the Communauté métropolitaine de Montréal and 2002-2003 school attendance data from the ministère de l'Éducation, du Loisir et du Sport du Québec.

A previous study on the geographic distribution of crime on the Island of Montréal (Savoie, Bédard, Collins; 2006) found that crime was not evenly distributed on the island, but somewhat concentrated in a limited number of hot spots. The results of this analysis show that, when youth crime is considered separately, crime is distributed over many small hot spots across the entire island.

The multivariate analysis showed that neighbourhood socio-economic characteristics alone could predict only a small proportion of youth crime in Montréal. However, factors such as the presence of a secondary school, commercial zoning and education have a minor impact on both violent crime and property crime. These findings are consistent with those of other studies on youth crime (Jacob, 2006; LaGrange, 1999).

Some recent studies (Dupéré et al., 2007; Hay et al., 2006; Simons et al., 2005) suggest that for young people, the influence of some neighbourhood characteristics have an influence primarily through their interaction with family or individual factors. In a survey of self-reported youth delinquency in Toronto, Savoie (2007) noted that some individual and family characteristics were significant risk factors for delinquency among young people. Collecting data on victimization and self-reported delinquency at the neighbourhood-level might be particularly useful for the analysis of youth crime.

Introduction

Following the research paper entitled "Neighbourhood Characteristics and the Distribution of Crime on the Island of Montréal" (Savoie, Bédard and Colins, 2006), this report is the second phase of the spatial analysis of police-reported crime data for Montréal. This study, funded by the National Crime Prevention Centre of Public Safety Canada, focuses in particular on the spatial distribution of youth crime. The maps presented in this study provide a visual overview of the places where youth crime is concentrated and of its associated characteristics; hence it may prove to be an important tool in developing strategies to prevent and combat crime among young people.

Previous spatial analyses of police-reported crime in other cities conducted by the Canadian Centre for Justice Statistics (Fitzgerald et al., 2004; Wallace et al., 2006; Savoie et al., 2006; Savoie, 2008) showed that crime was not distributed evenly in a municipality. In addition, the rate of police-reported crime in neighbourhoods was shown to be associated with various socio-economic, demographic and land-use factors.

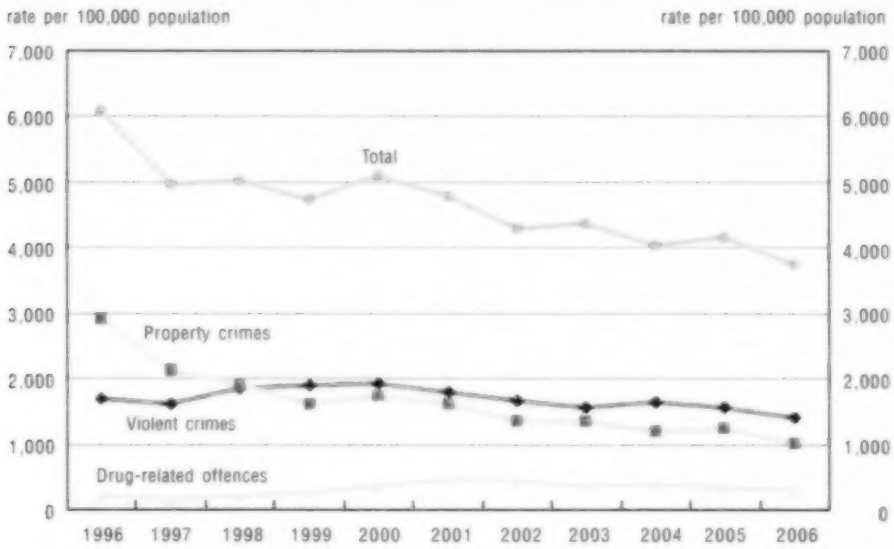
This report provides a picture of the major trends in youth crime in Montréal. It analyzes the spatial distribution of youth crime and the neighbourhood factors that affect this distribution. In addition, the results obtained for youth crime are compared with Savoie's (2006) observations concerning total crime on the Island of Montréal. Readers wanting detailed information on the methodologies used must refer to the report: *Neighbourhood characteristics and the distribution of crime on the Island of Montréal* (Savoie et al., 2006).

Youth crime trends in Montréal[1,2]

Montréal has a lower youth crime rate than the Canadian average and the Quebec average. In fact, the Montréal census metropolitan area (CMA),[3] which includes Montréal and its suburbs, has a lower youth delinquency rate than any other CMA in Canada except the City of Québec CMA. Nevertheless, between 1996 and 2006 the trends in youth crime on the Island of Montréal remained similar to those observed for the province of Quebec and for Canada as a whole: a general downward trend attributable to a sharp decline in property crime (Chart 1). Violent and drug-related incidents were up slightly, in particular because of an increase in level 1 and 2 assaults and cannabis possession, but their number has been falling since the early 2000s.

Chart 1

Crime rate trend on the Island of Montréal, 1996 to 2006



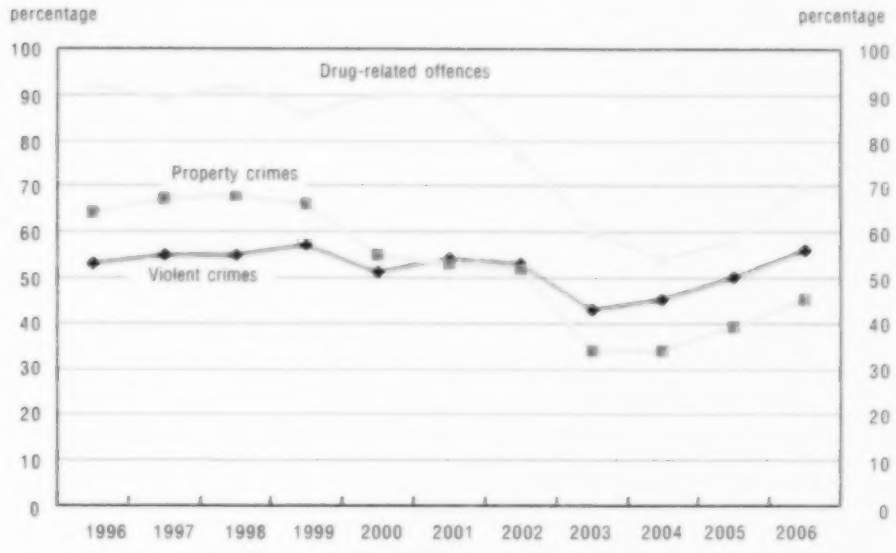
Source: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey, UCR2.2.

On the other hand, the proportion of apprehended adolescents who were formally charged was higher in Montréal than in Quebec or Canada as a whole, especially for drug-related incidents (Chart 2). In 2006, for example, 70% of the young people apprehended in Montréal in connection with drug-related incidents were formally charged, compared with 31% for the province of Quebec. It should

be noted, however, that greater use of formal sanctions is typical of larger cities; in Quebec, the City of Québec, Sherbrooke and Gatineau CMAs also had above-average charge rates.

Chart 2

Proportion of incidents resulting in formal charges, Island of Montréal, 1996 to 2006



Source: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey, UCR2.2.

The trend in charge rates in Montréal is also slightly different from what has been observed nationally in recent years. In both Montréal and Canada as a whole, charge rates fell when the *Youth Criminal Justice Act (YCJA)* came into force. Nationally, they have remained low ever since (with the exception of drug-related offences), but in Montréal, charge rates quickly returned to pre-2003 levels (Chart 2). These differences may be due to the fact that some policing practices and the administration of youth justice may vary from province to province (Taylor-Butts and Bressan, 2008).

Spatial distribution of youth crime in Montréal

The following analyses are based on geocoded data. In 2001, geocoding was carried out for 4,369 criminal incidents in which at least one person between the ages of 12 and 17 was apprehended and identified by the Montréal police service. These incidents involved a total of 5,785 youths aged 12 to 17,[4] nearly 14% of all accused identified by police. Of those 4,369 cases, 42% were violent incidents, 45% were property crimes and 11% were drug-related offences. The proportions are slightly different from the national figures, in particular because the geocoded data do not include "other *Criminal Code* offences".[5] However, even if those offences are ignored, the proportion of violent crimes is slightly higher in Montréal than in Quebec or Canada as a whole, but similar to Toronto.

Youth crime on the Island of Montréal is distributed differently from adult crime. Unlike adult crime, which is concentrated in a few "hot spots" (Savoie, 2006), youth crime is distributed across many limited kernels (Map 1). Savoie et al. (2006) also noted significant differences between young people and adults with reference to the distance between the residence of the person charged and the place where the offence was committed.

Map 1

Spatial distribution of youth crime on the Island of Montréal, 2001

Counts based on 4,369 incidents.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey, UCR2.2.

Violent crime

Based in its spatial distribution, violent crime in the population aged 12 to 17 is different from violent crime in the adult population. When looking at the way youth crime is distributed in Montréal, we note that, unlike adult crime which is primarily concentrated in the downtown area and a few other hot spots, youth crime is scattered across the entire island in a number of small kernels. A number of those kernels correspond to the locations of secondary schools or, in some cases, other public institutions such as youth centres. In fact, 27% of violent crimes involving young people occurred at school.

The most frequent crimes of violence among youth aged 12 to 17 were level 1 assaults (41%), level 2 assaults (19%) and uttering threats (17%). In addition, the presence of a weapon was noted in about 22% of cases, nearly the same proportion as for adults.

While a large proportion of the violent youth crimes were committed on school grounds, the proportion of violent incidents involving a weapon was lowest in places with substantial surveillance, such as schools (17%), public institutions (14%) and public transportation facilities (16%). Conversely, a larger proportion of violent incidents involving a weapon occurred in commercial buildings (36%), parking lots (29%), apartment buildings (27%) and streets, highways or parks (26%).

When a weapon was involved in a violent incident on school property, 78% of the time it was a knife, a sharp instrument or a blunt object; it was a firearm less than 1% of the time.

Furthermore, 51% of violent crimes reported in schools were level 1 assaults, compared with only 37% in other locations. Uttering threats (20%) and level 2 assaults (18%) were the other most common crimes that occurred on school property.

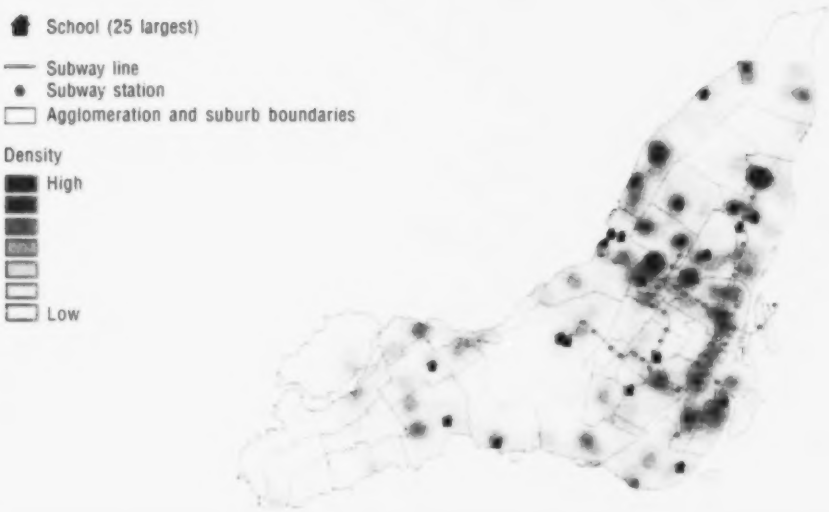
It is worth noting, however, that in Montréal, the handling of violent and drug-related incidents is left mostly to the discretion of school directorates.[6] Hence, the number of violent and drug-related incidents may vary widely from school to school according to their respective policies.

In 58% of violent incidents involving at least one person between the ages of 12 and 17, the victims knew at least one of the aggressors. In fact, it was most often an acquaintance (49%), and a relative only 9% of the time. Youths are therefore much less likely to be involved in violent offences against family members (44%) than are adults. Young people were however, a little more likely than adults to assault a stranger: in youth crime, 42% of the victims were strangers, compared with 28% for adult crime.

A large proportion of incidents, the victims of young aggressors were also youth. In fact, in 44% of incidents in which at least one of the accused was between the ages of 12 and 17, the victims were between 12 and 17 years of age. In a substantial number of these incidents, the victims were aged 18 to 24 (15%), while people aged 65 and over made up only 1% of the victims.

Map 2

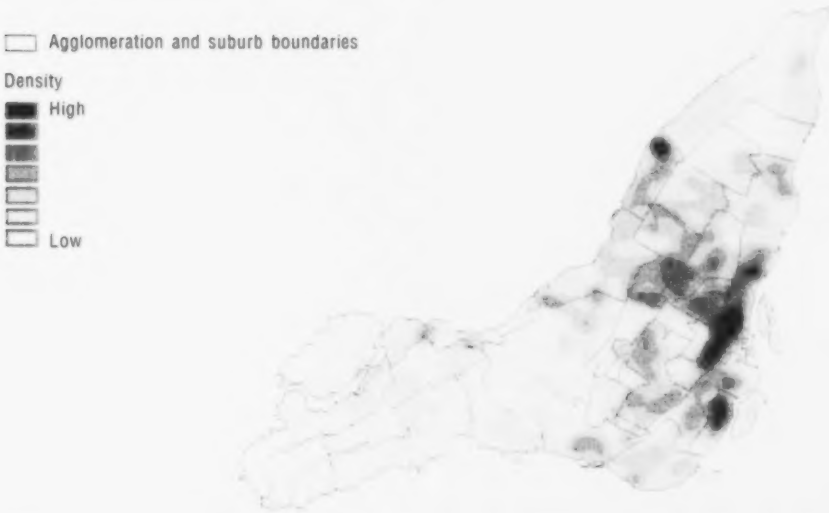
Kernel density distribution of violent crime incidents, youth aged 12 to 17, Montréal, 2001



Counts based on 1,844 violent crime incidents.
Source: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey, UCR2.2.

Map 3

Kernel density distribution of violent crime incidents, adults, Montréal, 2001



Counts based on 15,143 violent crime incidents.
Source: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey, UCR2.2.

Property crime

Among all types of property crimes, the most common property crime among youth aged 12 to 17 was theft under $5,000 (58%), followed by mischief (13%) and breaking and entering (12%). Among adults, the pattern of property crime was quite different, as the most frequent offences were theft under $5,000 (50%), breaking and entering (24%) and fraud (12%).

Since shoplifting is the most common offence among youth aged 12 to 17, property crime kernel densities tend to line up with large shopping centres. The highest property crime densities are found in the downtown area, the Carrefour Angrignon and Fairview Pointe-Claire. For adults, shopping areas continue to have substantial density levels, but since 24% of adult property crimes involve breaking and entering, more residential districts, such as Plateau Mont-Royal, Hochelaga-Maisonneuve and the south central area, also have high densities.

Map 4

Kernel density distribution of property crime incidents, youth aged 12 to 17, Montréal, 2001

Counts based on 1,950 property crime incidents.

Source: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey, UCR2.2.

Map 5

Kernel density distribution of property crime incidents, adults, Montréal, 2001

Counts based on 13,973 property crime incidents.
Source: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey, UCR2.2.

Drug-related offences

Drug-related offences accounted for 11% of all incidents involving a person between the ages of 12 and 17. Two thirds (67%) of these offences were cannabis possession, and 13% cannabis trafficking. In contrast, cannabis possession made up only 42% of drug-related offences among adults, while cocaine trafficking (15%) and possession (14%) were about four times more common.

For youth aged 12 to 17, the distribution of drug-related offences is very similar to the distribution of violent crimes: a large number of small kernel densities scattered across the entire island. A large proportion (21%) of these offences occurred on school property. Cannabis possession alone accounted for 85% of the offences that took place on school property.

Other drug-related incidents occurred more commonly in the street (24%) and in public transportation facilities (14%), mainly in the downtown area and near the Berri-UQAM, Mont-Royal and Honoré-Beaugrand metro stations. Among adults, drug-related crime was almost exclusively concentrated in the downtown area and around the Berri-UQAM and Mont-Royal metro stations.

Map 6

Kernel density distribution of drug-related offences, youth aged 12 to 17, Montréal, 2001

Counts based on 471 drug-related offences.
Source: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey, UCR2.2.

Map 7

Kernel density distribution of drug-related offences, adults, Montréal, 2001

Counts based on 2,194 drug-related offences.
Source: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey, UCR2.2.

Crime involving more than one offender[7]

A large proportion of the incidents that involved at least one youth (30%) had more than one accused, which includes all crimes in which at least one youth acted with one or more accomplices, regardless of the age of the accomplice(s). In contrast, adults acted with one or more accomplices in only 8% of incidents. The type of crime was different when a youth acted with one or more accomplices, as youths with accomplices were responsible for 63% of breaking-and-entering offences, 57% of robberies and 47% of mischief offences involving youths. In addition, for crimes of violence, the probability that a weapon was involved was greater when there was more than one accused: a weapon was found in 29% of incidents involving more than one accused, compared with 19% of the cases in which a single youth was apprehended.

Multivariate analysis

Savoie et al. (2006) showed that crime was not randomly distributed across the Island of Montréal, but was concentrated in certain neighbourhoods, and that crime levels varied with demographic, socio-economic and urban land-use factors. From the kernel density distribution maps, it is clear that youth crime occurs in a large number of small kernels, or hot spots scattered across the entire island. The analyses that follow focus on the influence that the characteristics of the island's neighbourhoods have on variations in police-reported youth crime levels in those neighbourhoods. The set of demographic, socio-economic and land-use characteristics is defined in the "Methodology" section of Savoie et al. (2006).

The results of the multivariate analysis are presented in Table 1. In particular, the figures show that the explanatory regression models of variations in youth crime rates at the neighbourhood-level have much lower coefficients of determination than those produced by the models of total crime (Savoie et al., 2006). For example, for youth crime, the squared coefficients of correlation between the observed values and the values predicted by the model were only 0.23 for violent crime and 0.14 for property crime. In comparison, the squared correlation coefficients produced by Savoie et al. (2006) for total crime were 0.60 and 0.62, respectively. However, these results are similar to the findings of other Canadian (Jacob, 2006; LaGrange, 1999) and American (Peterson, 2002) studies on youth crime that had concluded that a number of neighbourhood characteristics had only a minor impact on youth crime.

While multivariate models appear to have little explanatory power in Montréal's case, some factors do have a limited, but statistically significent influence. In particular, this is true of the number of students attending secondary schools in the neighbourhood and commercial zoning, which have the strongest explanatory power for both violent crime and property crime rates variation at the neighbourhood-level. School is where most young people spend a good part of their day, and they commit many of their crimes nearby. In addition, as Tremblay and Ouimet (2001) have pointed out, the risk of assault or theft from persons increases in places with a high density of urban movement and interaction; two such places are schools and shopping centres. These locations, particularly retail stores, also present crime opportunities for youths, whose property offences are mostly shoplifting and mischief. These findings converge with observations by LaGrange (1999), who noted that the presence of a secondary school or a shopping centre was a key factor affecting the number of mischief offences. LaGrange pointed out that such places attracted a large number of non-residents to a neighbourhood, which would reduce the effectiveness of collective surveillance.

Table 1

Spatial autoregression model for violent and property crime rates,[1] youth aged 12 to 17, Montréal neighbourhoods, 2001

	Violent crime rate[2]	Property crime rate[2]
	regression coefficient (b)	
Number of students attending a school in the neighbourhood	0.49***	0.19**
Commercial zoning percentage	0.22***	0.37***
Percentage of persons with a university degree	...	-0.25**
Percentage of persons without a secondary school diploma	0.14*	...
Percentage of recent immigrants (arrived between 1991 and 2001)	-0.33***	...
Percentage of the population that belongs to a visible minority	0.29***	...
Percentage of persons in low-income households	0.25***	...
Male/female ratio	...	-0.19**
Percentage of persons who lived in another neighbourhood in 1996	...	0.25***
Percentage of dwellings in need of major repairs	0.13*	...
Spatial lag variable	0.31*	0.39*
Correlation squared (r^2)	0.23	0.14

... not applicable

* $p<0.05$.

** $p<0.01$.

*** $p<0.001$.

1. Police-reported violent and property crime rates, based on the number of residents aged 12 to 17 (log transformed). Based on the 506 census tracts (CTs) with more than 250 residents.

2. Regression models include intercept.

Note: Variables are standardized z-scores.

Sources: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey, UCR2.2, geocoded database, 2001 and 2001 Census; 2005 zoning data, Communauté métropolitaine de Montréal; Ministère de l'éducation, du loisir et du sport du Québec, school attendance data, 2002/2003.

Several socio-economic factors, such as the proportions of people living in low-income households, of dwellings requiring major repairs, of members of visible minorities and of people without a secondary school diploma, also push the violent crime rate upward. In contrast, the proportion of recent immigrants[8] lowers the violent crime rate; it acts as a protective factor. The property crime rate was also pushed upward by residential instability but downward by the male/female ratio and the proportion of people with a university degree.

These results are consistent with observations by Jacob (2006), who noted that a number of neighbourhood characteristics had only a minor effect on youth crime, but that education, occupation and residential instability were nevertheless important factors.

The multivariate analysis showed that neighbourhood socio-economic characteristics alone could predict only a small proportion of youth crime in Montréal. Some recent studies (Dupéré et al., 2007; Hay et al., 2006; Simons et al., 2005) suggest that for young people, the influence of some neighbourhood characteristics have an influence primarily through their interaction with family or individual factors. In a survey of self-reported youth delinquency in Toronto, Savoie (2007) noted that some individual and family characteristics were significant risk factors for delinquency among young people. Collecting data on victimization and self-reported delinquency at the neighbourhood-level might be particularly useful for the analysis of youth crime.

Finally, some caution needs to be exercised with respect to the scope and the generalization of the data. First, the data indicate where the offences took place, which does not mean that they were committed by youths who live there. In this regard, Tremblay and Ouimet (2001) noted that a high proportion of youths arrested in Montréal did not live in the neighbourhood where they committed their offences. Similarly, Savoie et al. (2006) observed that for violent crimes, the median distance between the accused's residence and the place where the offence was committed was 2.47 kilometres. Savoie (2007) and Carrington (2005) also showed that a small number of youths commit the majority of the offences. That said, with the data available here, it cannot be determined whether a crime hot spot is due to one or a few very active youths or a larger number of young offenders.

Methodology

Data

The analysis in this paper used police-reported crime data from the Incident-based Uniform Crime Reporting Survey (UCR2). Since the data are provided by police, only criminal acts reported to the police are counted. In addition, since the analysis focuses primarily on youth delinquency, only incidents in which a youth was apprehended and identified are included.

According to data from the 2004 General Social Survey (GSS) on victimization, 39% the incidents that occurred in the Montréal CMA were reported to police. Police-reported crime rates can be affected by a number of factors, including people's inclination to report incidents, reporting of incidents by police, and changes in laws or law enforcement practices. A new law dealing with youth crime, the *Youth Criminal Justice Act (YCJA)*, was proclaimed in 2003, superseding the *Young Offenders Act (YOA)*, which had been in effect since 1984. This legislative change and its impact are discussed in detail in Taylor-Butts and Bressan (2008).

The socio-economic data for neighbourhoods (census tracts) are from the 2001 Census. Although some 2006 Census data are already available, the 2001 data were more complete at the time of writing. In addition, using 2001 Census data provides greater compatibility with geocoded police data, which are also from 2001, and the previous report on crime in Montréal (Savoie, 2006), which was based on 2001 data.

Definitions[9]

Crime rate (of adolescents) and number of crimes: The youth crime rate and the number of crimes are based on the number of young people apprehended by police, whether they are formally charged or not. Since only crimes in which a chargeable suspect has been identified are counted, the actual number of crimes committed by young people may be understated. The crime rate is obtained by dividing the number of crimes by the population aged 12 to 17 and is expressed as a number per 100,000 people between the ages of 12 and 17.

Charged: When the police apprehend a suspect, they may decide to take informal or extrajudicial action (a warning, referral to community programs, no action) or lay formal charges. The term "charged" applies to incidents that resulted in a formal charge. Note that the number of incidents that did not result in formal charges may be understated, because the police do not always keep complete files in such cases, which usually involve a minor offence.

Not charged: Suspect identified but against whom no formal charges are laid.

Accused: Refers to all young people identified by the police as chargeable suspects in a criminal case, both charged and not charged.

Kernel density: A location where a large number of crimes are concentrated. Note that concentrations are based solely on the number of crimes and do not take into account the density of the resident population or the population at risk.

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Endnotes

1. For more details on trends in youth crime in Canada, see Taylor-Butts and Bressan (2008).
2. The terms Montréal and Montréal Island are used interchangeably in this report and correspond to the territory serviced by the police service of the city of Montréal.
3. A census metropolitan area (CMA) must have a population of at least 100,000, and urban core must have a population of at least 50,000.
4. One person could be counted more than once if he or she was involved in more than one incident.
5. The "other *Criminal Code* offences" category includes crimes such as escape and failure to comply with a court order.
6. The largest school board in Montréal, the Commission scolaire de Montréal (CSDM), provides support and materials to school directorates. Nevertheless, the school directorates determine the intervention protocols (see CSDM, 2007 and CSDM, 2004). Other school boards on the Island of Montréal may have a different approach.
7. Crime involving at least one person between the ages of 12 and 17 and at least one other accused, regardless of age.
8. Immigrants who arrived in Canada in the last 10 years (1991 to 2001).
9. For all definitions and variables used in this study, see Savoie et al., 2006.

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